Editorials

Medical Associations and the Pace of Change

AN INCREASING PACE of technologic and social change is a dominant characteristic of these times. It affects every aspect of society and each is seeking ways to cope. Medical associations are by no means exempt from the stresses this produces and the need to adapt to them. The root cause of all this, of course, is the scientific and technologic progress that is occurring so rapidly in both medicine and society. And the rate of this progress and the pace of this change is not likely to diminish very much in the foreseeable future.

Medical associations are creatures of their member physicians, and must therefore be responsive to their concerns. But they are also human institutions with a life of their own. They each have an internal and an external environment with which they must interact. The internal environment is made up of all the persons who make up the association or who work for it, and their concerns. The external environment is the external world of evolving patient care and social change affecting medicine and its practice, and the public's expectations of the medical profession. The structural organization of medical associations stems from quieter times when the problems of medicine and the society it serves were less complicated and less intertwined with one another. The intrusion, intervention or participation of third parties in medical practice and patient care had not yet occurred to any significant extent and medical associations were able to devote themselves to promoting scientific medicine, professional education and the public health. But now this organizational structure, which worked so well for so long, finds itself hard pressed to cope with the pace of social as well as professional change.

Medical associations are organized as democratic societies governed by their members who individually have a greater or lesser interest in contributing to or participating in this governance. The governance is left to a relative few. Partly for this reason it is the nature of democratic societies to tend to be more sensitive to their internal organizational imperatives than to what may be perceived by many to be the more important imperatives imposed by the external environment. They also tend to be more reactive than proactive. It is often difficult for them to think or plan very far ahead—that is, beyond the next election. It is also in the nature of any association of humans to develop an internal organization or bureaucracy to enable those who work within the association, who are necessarily dependent on one another, to work effectively together. This occurs whether in the federal government, a business corporation or a medical society. Elected or appointed officials become as much a part of these corporate or societal internal organizations as do the hired hands. And, as this internal organization or bureaucracy takes on a life of its own, it develops its own imperatives and also begins to consume organizational resources that tend to be drawn away from the at least equally important organizational goals that are the stated purposes of the organization. To the extent an organization or association becomes absorbed in itself and unduly focused on its internal imperatives, it can lose its ability to effectively pursue the goals in the external environment which are its reason for existence. Since they are always limited, an association's energy and resources must be skillfully deployed if the organization is ever to accomplish its purposes and goals.

It also should be obvious that if an association is to be effective, it is essential that its purposes and goals be clear, within its professional competence to accomplish, and achievable within its resources. One can only wonder how effectively the always limited resources of some of our medical associations are now being used. To what extent are the internal imperatives, important as they always are, drawing energy and resources away from the external imperatives of the association in the world of medical practice and patient care that is changing so rapidly? And to what extent are the external purposes and goals really clearly defined, truly within the competence of the medical profession to accomplish and actually achievable within the resources of the association? One senses that too often medical associations are attempting to achieve goals that are beyond any professional competence they can bring to bear or what resources they have available. Where this is the case it can only amount to an expensive exercise in futility. And one also senses that the natural tendency of any bureaucracy to focus primarily on its internal imperatives may too often be impairing the effectiveness of some medical associations as they attempt to influence the external environment of medical practice and patient care. To the extent any of this is the fact, a review of an association's purposes and specific goals in terms of its internal and external imperatives, and the professional competence and resources it can bring to bear, would seem to be in order. The pace of change in both medicine and society is now so great that the energies and resources of our medical associations must be applied as efficiently and as flexibly as possible to keep up with an ever increasing pace of change, or organizational failure with all of its consequences may be inevitable.

MSMW

Heterogeneity in Type II Diabetes

ROSALYN YALOW and the late Solomon Berson developed the first accurate and reproducible immunoassay for insulin at the Veterans Administration Hospital in the Bronx in the late 1950s.[1] Thus the initial diabetic subjects who were studied had the non-insulin-dependent (type II) or maturity-onset variety of diabetes mellitus, meaning usually normal or high levels of insulin but yet levels that were disproportionately low relative to the concentration of glucose. In the succeeding 2½ decades innumerable papers have appeared discussing this apparent hyperinsulinemia in persons with type II diabetes and Davidson has reviewed many of these studies in this issue of the journal. The observation that increased levels of insulin are required in many middle-aged diabetic persons, however, goes back much further than the early 1960s; soon

after the availability of insulin some 60 years ago, clinicians noted that fat persons with diabetes frequently required relatively large doses of insulin to initiate lowering of glucose values.[2] Likewise, the Scottish pathologist Ogilvie noted that obese persons who did not have diabetes had β-cell hyperplasia at autopsy.[3] In addition, a large number of pathologists dating all the way back to Opie at the turn of the century noted that subjects with diabetes, be they obese or nonobese, showed many degenerative changes in the islets of Langerhans, including fibrosis, glycogen deposition, amyloid infiltration and, in all, a decreased number of β-cells compared with an age-matched population.[4]

Much of the above history has faded into the background by the large amount of research activity in the past decade focused on insulin binding to cells and the decreased binding in insulin-resistant states, as well as the relative role that binding kinetics play in insulin resistance. As reviewed by Davidson, most now feel that the decreased binding is important but less significant than a blunting of insulin's secondary effects inside the cell, which is now the topic of a large number of scientific inquiries around the world. In brief, we really do not yet know how insulin initiates intracellular events. In any case, all of this research and clinical activity has promoted the concept that type II diabetes is due to impedance to the peripheral effects of insulin, in contrast to the earlier literature that primarily indicated decreased β-cell function as the cause. The final answer, as is usually the case in medicine, lies probably somewhere in between. It is best to think of maturity-onset, type II or non-insulin-dependent diabetes mellitus—whichever definition one prefers to use—as a component of a spectrum, ranging on one hand to pure β-cell deficiency and on the other to a severe degree of insulin resistance due to obesity and several other factors. Thus there are some patients, usually in the eighth or ninth decade, who are thin, relatively active and in whom there may be such a degree of β-cell deficiency that they have to be maintained on a regimen of single, and many times twice-a-day, insulin injections. They are essentially as insulin-dependent as would be an adolescent with type I diabetes. On the other end of the spectrum is a person with immense "middle-age spread," weighing 115 to 160 kg (250 to 350 lbs), who has supernormal insulin values, but still not quite enough to overcome the insulin resistance induced by the adiposity, overnutrition and decreased activity. In fact, if one looks at a number of 400 or 500 pounders, a normal glucose tolerance is almost impossible to find other than in some subjects in whom this large degree of obesity was present through childhood and who are then studied in the second or third decade. Thus, theoretically, perhaps even a normal human cannot muster up enough β-cell function should there be a sufficient degree of insulin resistance as in extreme obesity. This is also seen in some of the rare states such as lipoatrophic diabetes in which prodigious insulin secretions can be achieved, but because of the pronounced peripheral insensitivity to the insulin, abnormal glucose homeostasis still ensues.[5]

Finally, why is there clinical heterogeneity in the capacity of β-cells to face the challenge of the insulin resistance associated with obesity, overnutrition and physical inactivity? The guess is that this may be the genetic component, and just as there is heterogeneity in many other inherited traits such as age of menopause or senescence of hair follicles leading to baldness, perhaps there is also an age-related heterogeneous distribution in the normal population in β-cell function, survival and perhaps capacity to divide when the challenge becomes sufficiently great. It is this heterogeneity that is probably inherited and is supported by the fact that identical twins with maturity-onset or type II diabetes are usually 100% concordant, in contrast to the one in two to one in four concordance in identical twins having insulin-dependent or type I diabetes.[6,7]

It has been suggested that many of the other aging phenomena associated with maturity-onset diabetes, including osteoporosis, emphysema, atherosclerosis, cataract and others, might also be related to the earlier β-cell senescence.[8] Perhaps the β-cell is the Achilles' heel, endocrinologically speaking, of the precocious senescence of a number of tissues, and all one needs is the added problem of a little insulin resistance due to one, two or all three of the obesity-overnutrition-decreased physical activity triad.

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Computers and the Physician

THE SLOW but relentless diffusion of computers into the medical workplace and into our medical lives continues to follow a predictable course. Whether we find satisfaction (and see promise) in this, or whether we are repelled by computers and would prefer to ignore them, is pretty well beside the point. Computer programs will find their proper place alongside such former high-technology devices as the clinical thermometer and the hemostat. One question that remains is, when will they find their place in physicians' offices?

Beginning about 30 years ago, the earliest application of computers to medicine took place in research settings where the computational power of the machine could be applied to complex or large-scale mathematical problems of medical significance, or to the storage and management of very large sets of files or records. From the start, there had been these two kinds of applications—arithmetical problems where the computer could perform its logical magic among sets of crisp numbers, and the dull and ponderous shuffling of text passages that it could only push about uncomprehendingly.

When large ("main frame") computers became available to medical investigators during the late 1950s and the 1960s, further applications were envisioned and, among these, the development of large-scale hospital information systems became a sort of holy grail. Launched with much enthusiasm,